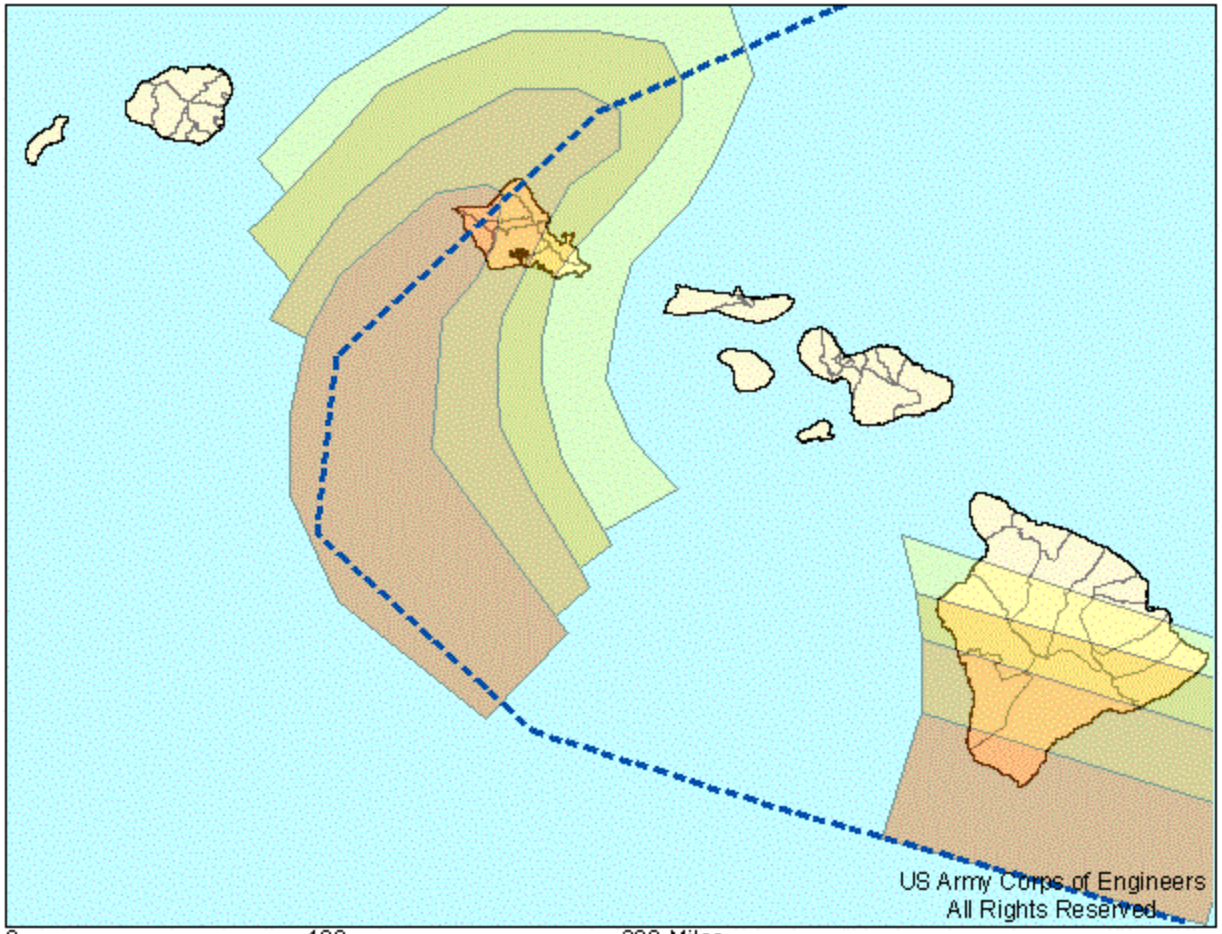
Hurricane Makani Projected Damage Areas

US Army Corps of Engineers

Landfall Expected In About 6 Hours

For Planning Purposes Only!



Post Landfall Projected Damage Areas

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Forecast Track

Projected Damage Areas

- CAT 0-type damage
- CAT 1-type damage
- CAT 2-type damage
- CAT 3-type damage
- CAT 4-type damage
- CAT 5-type damage

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

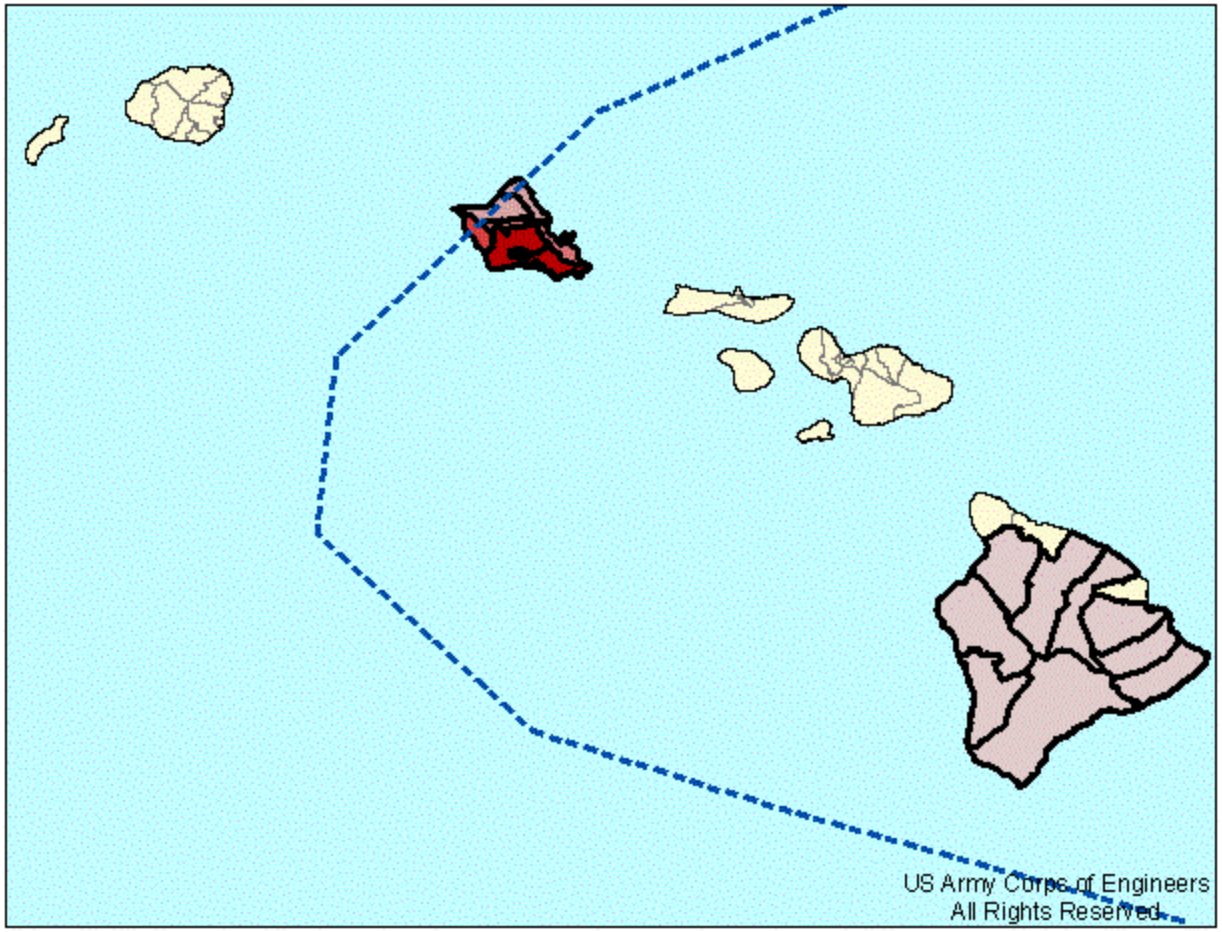
Hurricane Makani Projected Damage Areas	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 1 of 21

US Army Corps of Engineers

Hurricane Makani Debris Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!



Post Landfall Debris Model Results

HAWAII - 5,297,000 Yards

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Forecast Track

Debris

- < 100,000 cubic yards
- 100,000 - 249,999 cubic yards
- 250,000 - 499,999 cubic yards
- 500,000 - 999,999 cubic yards
- >1,000,000 cubic yards

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast. The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Debris Model

Generated By:
Siemsen, LRL 1105 HST 05/21/2008

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Makani Debris Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!

Island	Yards per Island	Geographic Unit	Yards per Geographic Unit
HAWAII		HAMAKUA - SOUTH	2,000
		KAU	60,000
		NORTH HILO	2,000
		NORTH KONA	92,000
		PUNA - NORTH	36,000
		PUNA - SOUTH	22,000
		SOUTH HILO - 1	33,000
		SOUTH KOHALA	7,000
		SOUTH KONA	68,000
HAWAII	322,000		
OAHU		EWA - BIG	2,001,000
		HONOLULU - BIG	1,372,000
		KOOLAULOA	117,000
		KOOLAUPOKO	335,000
		WAHIAWA	303,000
		WAIALUA	216,000
		WAIANAE	631,000
OAHU	4,975,000		

The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

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Hurricane Makani Debris Model

Generated By:
Siemsen, LRL 1105 HST 05/21/2008

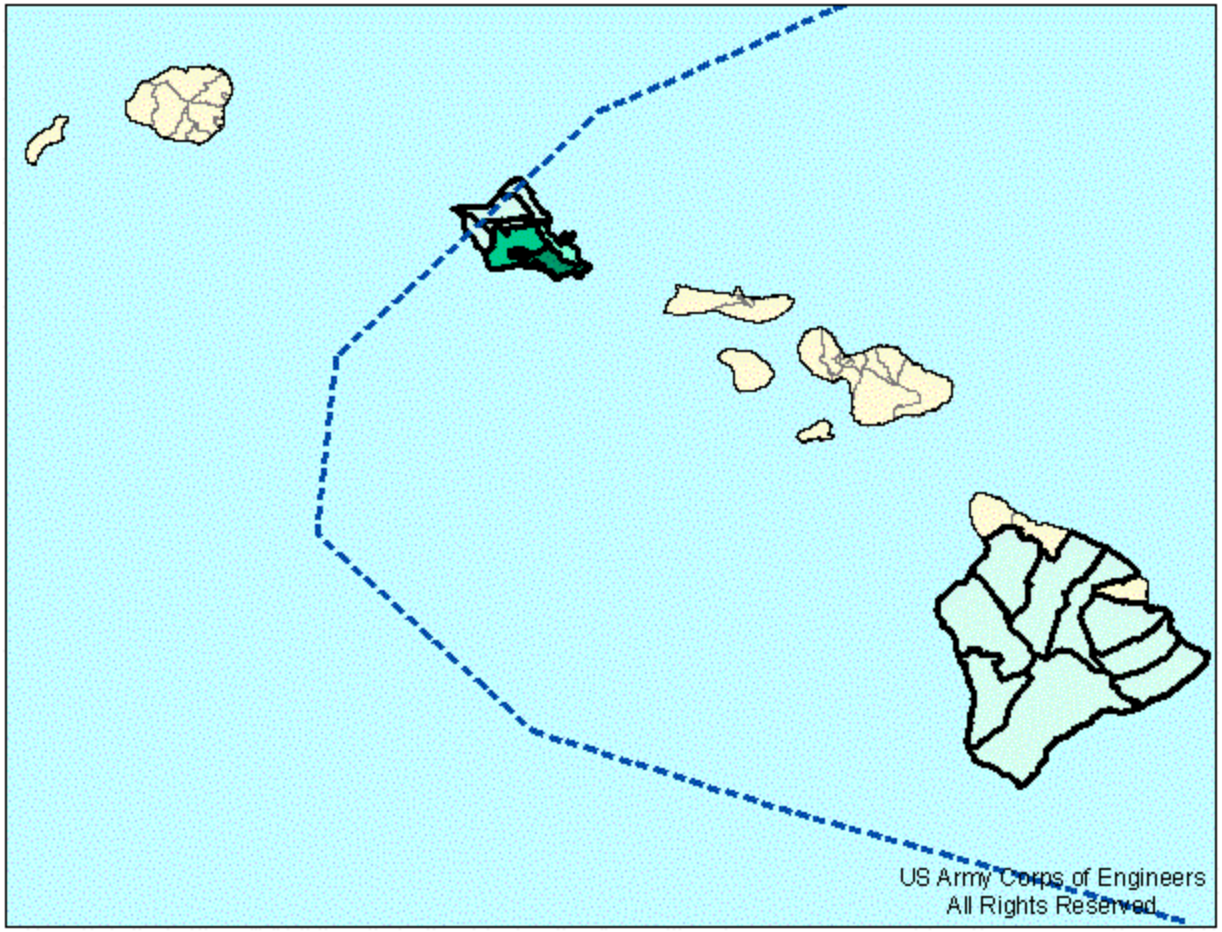
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Makani Commodities Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!



Post Landfall Water Model Results

Day One / Day Two / Day Three
HAWAII – 17/33/67 Truckloads

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Forecast Track

Commodities

- < 5 Trucks Each
- 5 - 10 Trucks Each
- 11 - 20 Trucks Each
- 21 - 40 Trucks Each
- > 40 Trucks Each

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC ***(1100 HST 05/21/2008)*** forecast. The amount of commodities forecasted is based on Mission Guide Book requirements and SME input. The graphic represents single day needs with full distribution system in place and operating.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Commodities Model	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 4 of 21

US Army Corps of Engineers

Hurricane Makani Commodities Model

Landfall Expected In About **6** Hours

For Planning Purposes Only!

Island	Truckloads per Island	Geographic Unit	Truckloads per Geographic Unit
HAWAII		HAMAKUA - SOUTH	1
		KAU	1
		NORTH HILO	1
		NORTH KONA	2
		PUNA - NORTH	1
		PUNA - SOUTH	1
		SOUTH HILO - 1	1
		SOUTH KOHALA	1
		SOUTH KONA	1
HAWAII	10		
OAHU		EWA - BIG	19
		HONOLULU - BIG	22
		KOOLAULOA	2
		KOOLAUPOKO	7
		WAHIAWA	3
		WAIALUA	1
		WAIANAE	3
OAHU	57		

The amount of commodities forecasted is based on Mission Guide Book requirements and SME input and the above table indicates suggested needs based on phased deployment of a commodities distribution system.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Makani Commodities Model

Generated By:
Siemsen, LRL 1105 HST 05/21/2008

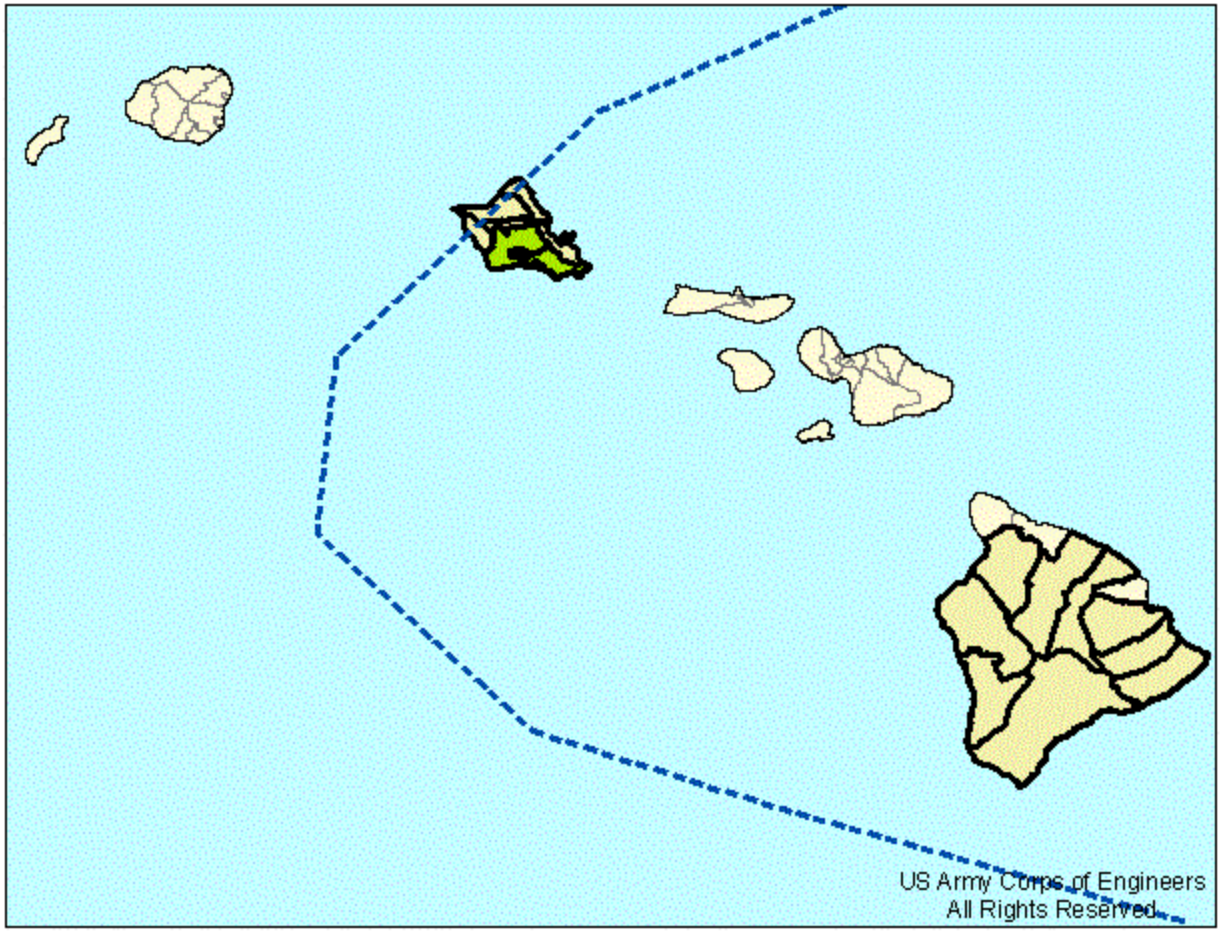
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Makani Temporary Roofing Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!



Post Landfall Temporary Roofing Model Results

HAWAII - 16,900

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Forecast Track

Temporary Roofing

- < 2,000 units
- 2,000 - 3,999 units
- 4,000 - 5,999 units
- 6,000 - 9,999 units
- > 10,000 units

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast. Temporary roofing is based on 4% in CAT 1, 7% in CAT 2 and 14% in CAT 3.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Roofing Model	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 6 of 21

US Army Corps of Engineers

Hurricane Makani Temporary Roofing Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!

Island	House Units per Island	Geographic Unit	House Units per Geographic Unit
HAWAII		HAMAKUA - SOUTH	< 100
		KAU	200
		NORTH HILO	< 100
		NORTH KONA	400
		PUNA - NORTH	200
		PUNA - SOUTH	< 100
		SOUTH HILO - 1	< 100
		SOUTH KOHALA	< 100
		SOUTH KONA	300
HAWAII	1,100		
OAHU		EWA - BIG	5,900
		HONOLULU - BIG	5,100
		KOOLAULOA	400
		KOOLAUPOKO	1,300
		WAHIAWA	900
		WAIALUA	600
		WAIANAE	1,600
OAHU	15,800		

Temporary roofing is based on 4% in CAT 1, 7% in CAT 2 and 14% in CAT 3.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

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Hurricane Makani Roofing Model

Generated By:
Siemsen, LRL 1105 HST 05/21/2008

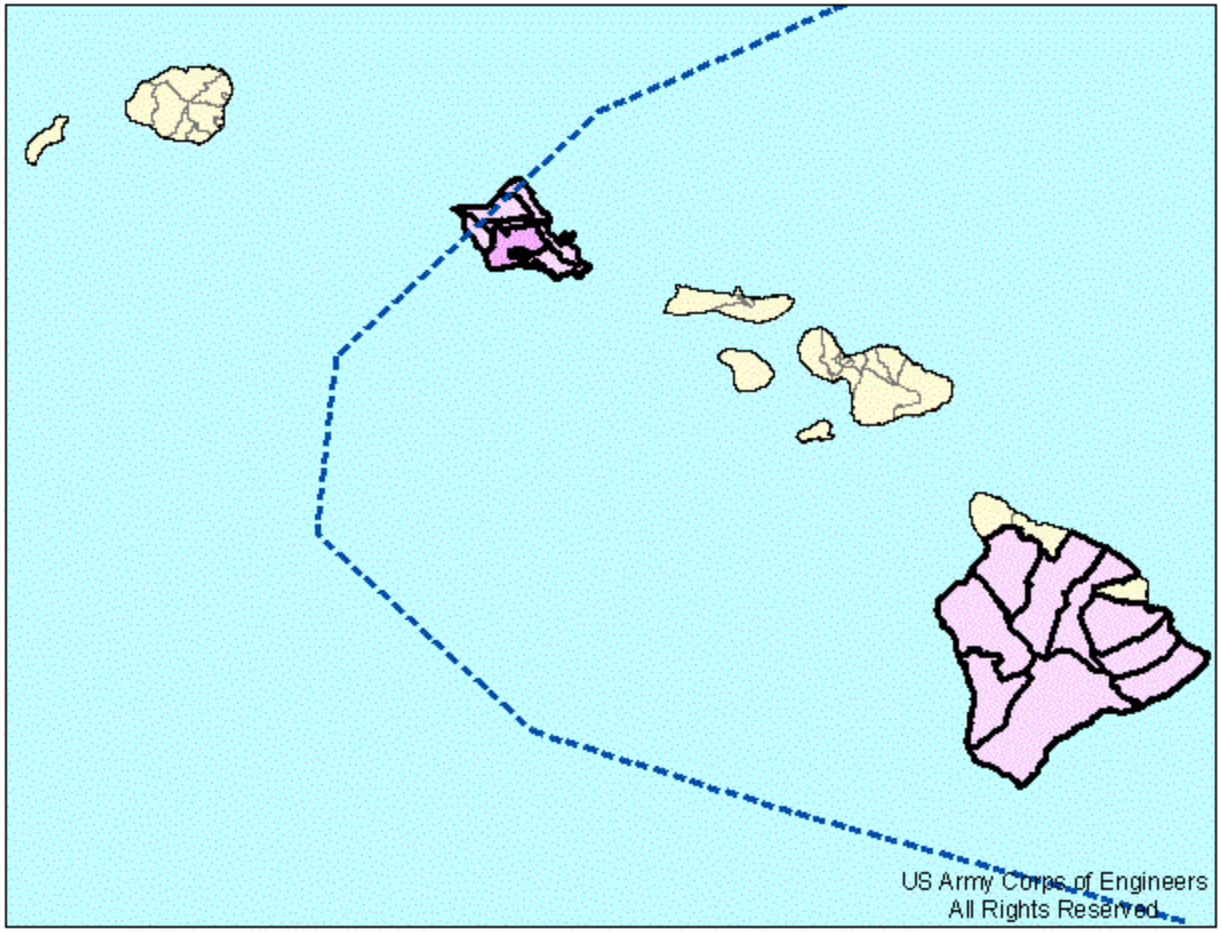
Sources:
HURREVAC
LRL-DEBRIS

Hurricane Makani Temporary Housing Model

US Army Corps of Engineers

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Post Landfall Temporary Housing Model Results

HAWAII - 6,200

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Forecast Track

Temporary Housing

- < 2,000 units
- 2,000 - 3,999 units
- 4,000 - 5,999 units
- 6,000 - 9,999 units
- > 10,000 units

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast. Temporary housing is based on 1% in CAT 1, 3% in CAT 2 and 6% in CAT 3.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Housing Model	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 8 of 21

US Army Corps of Engineers

Hurricane Makani Temporary Housing Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!

Island	House Units per Island	Geographic Unit	House Units per Geographic Unit
HAWAII		HAMAKUA - SOUTH	< 100
		KAU	< 100
		NORTH HILO	< 100
		NORTH KONA	200
		PUNA - NORTH	< 100
		PUNA - SOUTH	< 100
		SOUTH HILO - 1	< 100
		SOUTH KOHALA	< 100
		SOUTH KONA	100
HAWAII	300		
OAHU		EWA - BIG	2,500
		HONOLULU - BIG	1,400
		KOOLAULOA	200
		KOOLAUPOKO	400
		WAHIAWA	400
		WAIALUA	300
		WAIANAE	700
OAHU	5,900		

Temporary housing is based on 1% in CAT 1, 3% in CAT 2 and 6% in CAT 3.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

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Hurricane Makani Housing Model

Generated By:
Siemsen, LRL 1105 HST 05/21/2008

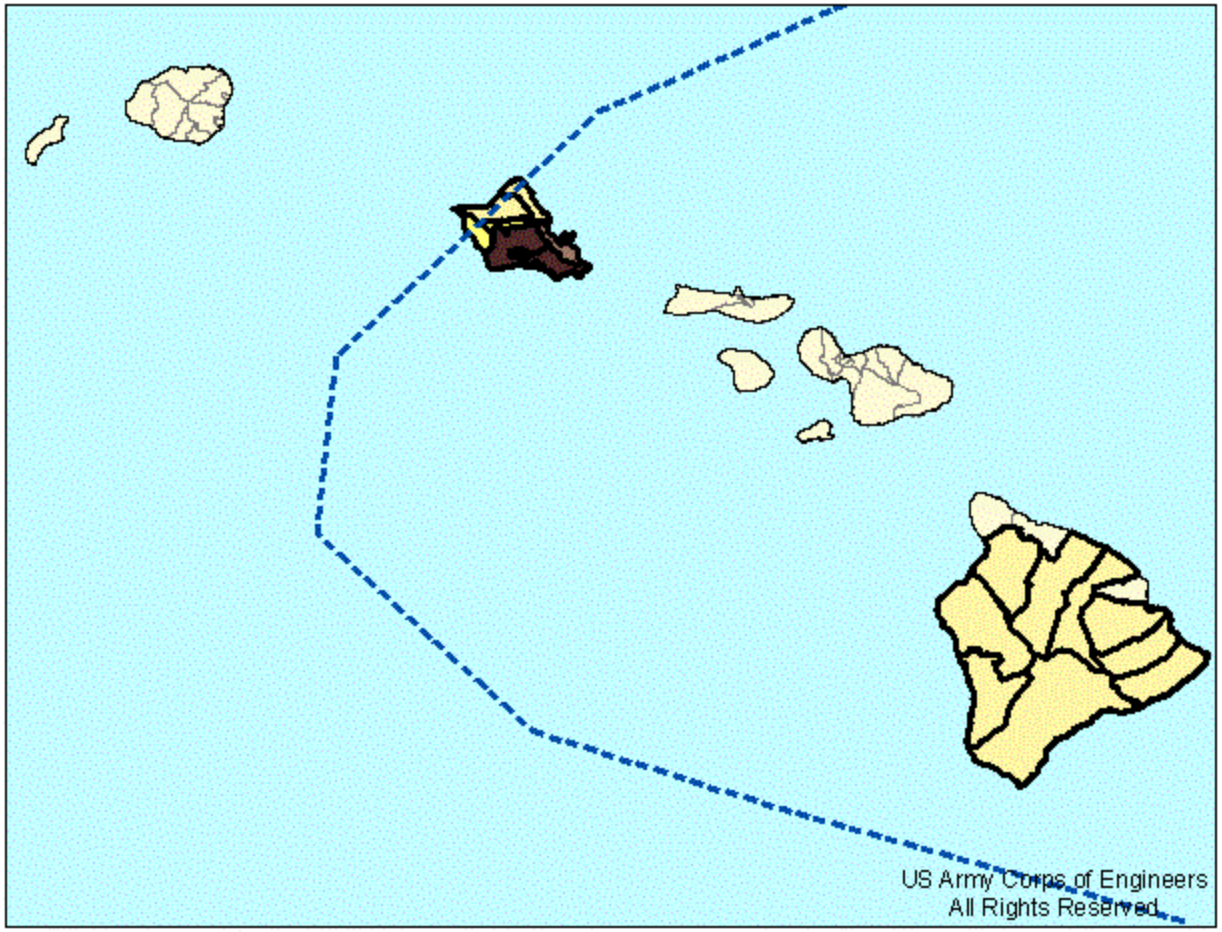
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Makani Population Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!



Post Landfall Population Model Results

HAWAII - 880,000

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Forecast Track

Population

- < 25,000 persons
- 25,000 - 99,999 persons
- 100,000 - 174,999 persons
- 175,000 - 249,999 persons
- > 250,000 persons

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast. The numbers of persons included in this model output are those that would be included within estimated hurricane force winds (Census 2000 values adjusted to July 2006 values).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Population Model	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 10 of 21

US Army Corps of Engineers

Hurricane Makani Population Model

Landfall Expected In About **6** Hours

For Planning Purposes Only!

Island	Population per Island	Geographic Unit	Population per Geographic Unit
HAWAII		HAMAKUA - SOUTH	< 1,000
		KAU	7,000
		NORTH HILO	< 1,000
		NORTH KONA	25,000
		PUNA - NORTH	7,000
		PUNA - SOUTH	7,000
		SOUTH HILO - 1	< 1,000
		SOUTH KOHALA	< 1,000
		SOUTH KONA	10,000
HAWAII	56,000		
OAHU		EWA - BIG	282,000
		HONOLULU - BIG	320,000
		KOOLAULOA	20,000
		KOOLAUPOKO	103,000
		WAHIAWA	40,000
		WAIALUA	15,000
		WAIANAE	44,000
OAHU	824,000		

The number of persons estimated to be within the hurricane force winds comes from Census 2000 values adjusted to July 2006 values.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

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Hurricane Makani Population Model

Generated By:
Siemsen, LRL 1105 HST 05/21/2008

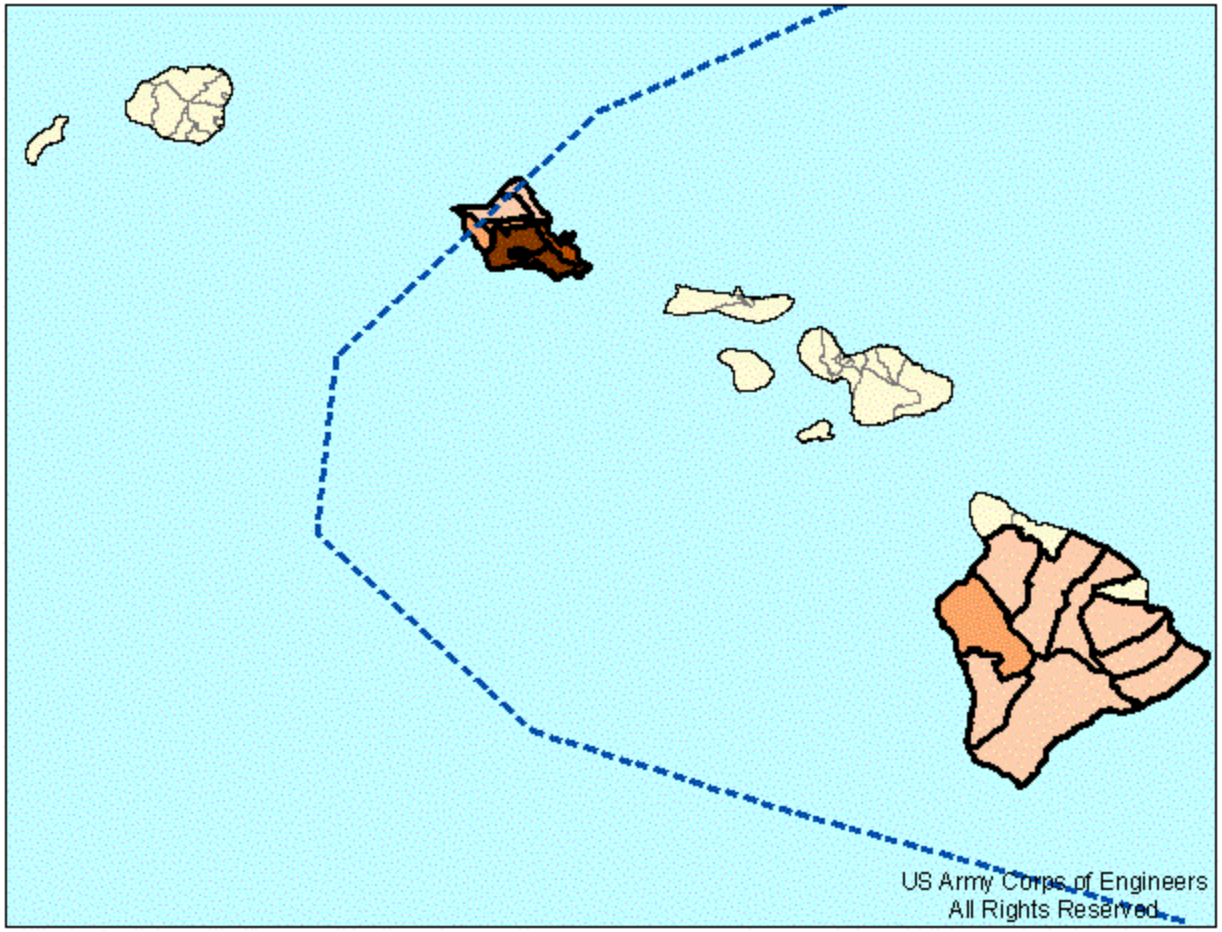
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Makani Households Model

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Post Landfall Households Model Results

HAWAII - 294,000

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Forecast Track

Households

- < 7,500 households
- 7,500 - 14,999 households
- 15,000 - 24,999 households
- 25,000 - 49,999 households
- > 50000 households

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast. The numbers of households included in this model output are those that would be included within estimated hurricane force winds (Census 2000 values adjusted to July 2006 values).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Households Model	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 12 of 21

US Army Corps of Engineers

Hurricane Makani Households Model

Landfall Expected In About **6** Hours

For Planning Purposes Only!

Island	Households per Island	Geographic Unit	Households per Geographic Unit
HAWAII		HAMAKUA - SOUTH	< 1,000
		KAU	3,000
		NORTH HILO	< 1,000
		NORTH KONA	10,000
		PUNA - NORTH	3,000
		PUNA - SOUTH	3,000
		SOUTH HILO - 1	< 1,000
		SOUTH KOHALA	< 1,000
		SOUTH KONA	4,000
HAWAII	23,000		
OAHU		EWA - BIG	83,000
		HONOLULU - BIG	123,000
		KOOLAULOA	6,000
		KOOLAUPOKO	32,000
		WAHIAWA	11,000
		WAIALUA	5,000
		WAIANAE	11,000
OAHU	271,000		

The number of households estimated to be within the hurricane force winds comes from Census 2000 values adjusted to July 2006 values.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

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Hurricane Makani Households Model

Generated By:
Siemsen, LRL 1105 HST 05/21/2008

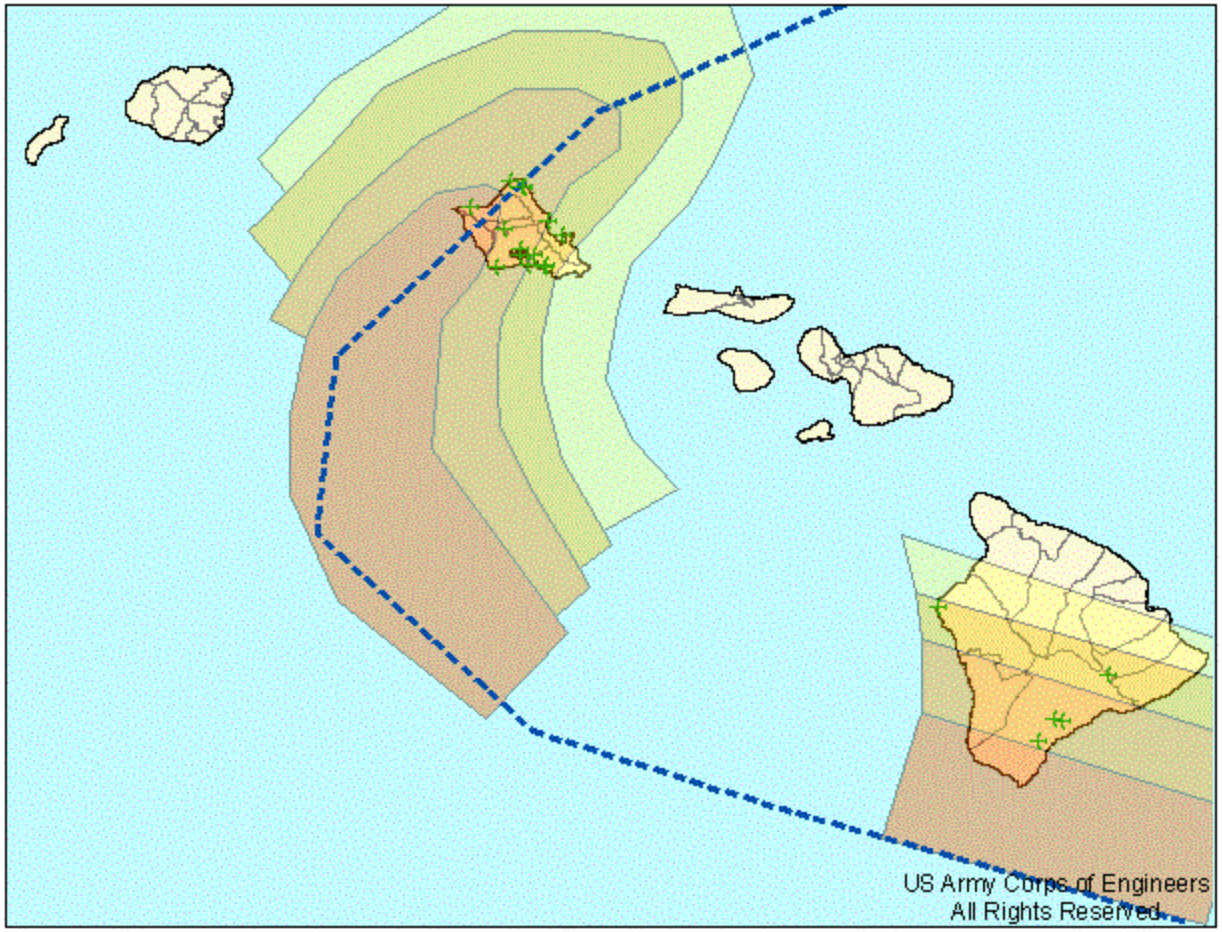
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Makani Airports

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Most Probable Landfall Airports Inside Hurricane Force Winds

Hawaii - 20

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Airports

Forecast Track

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of airports included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

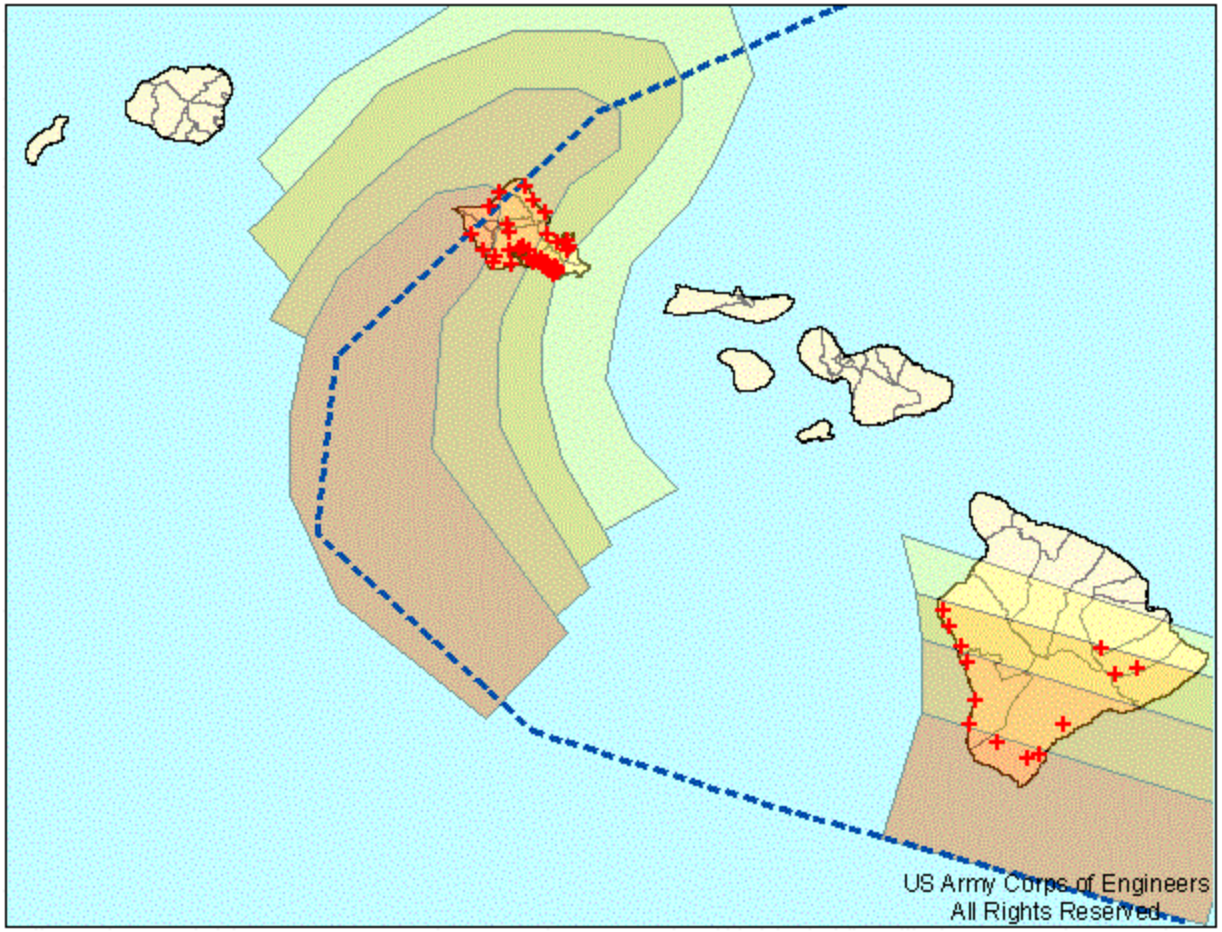
Hurricane Makani Airports	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 14 of 21

US Army Corps of Engineers

Hurricane Makani Fire Stations

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Most Probable Landfall Fire Stations Inside Hurricane Force Winds

Hawaii - 54

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

+ Fire Stations

Forecast Track

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of fire stations included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

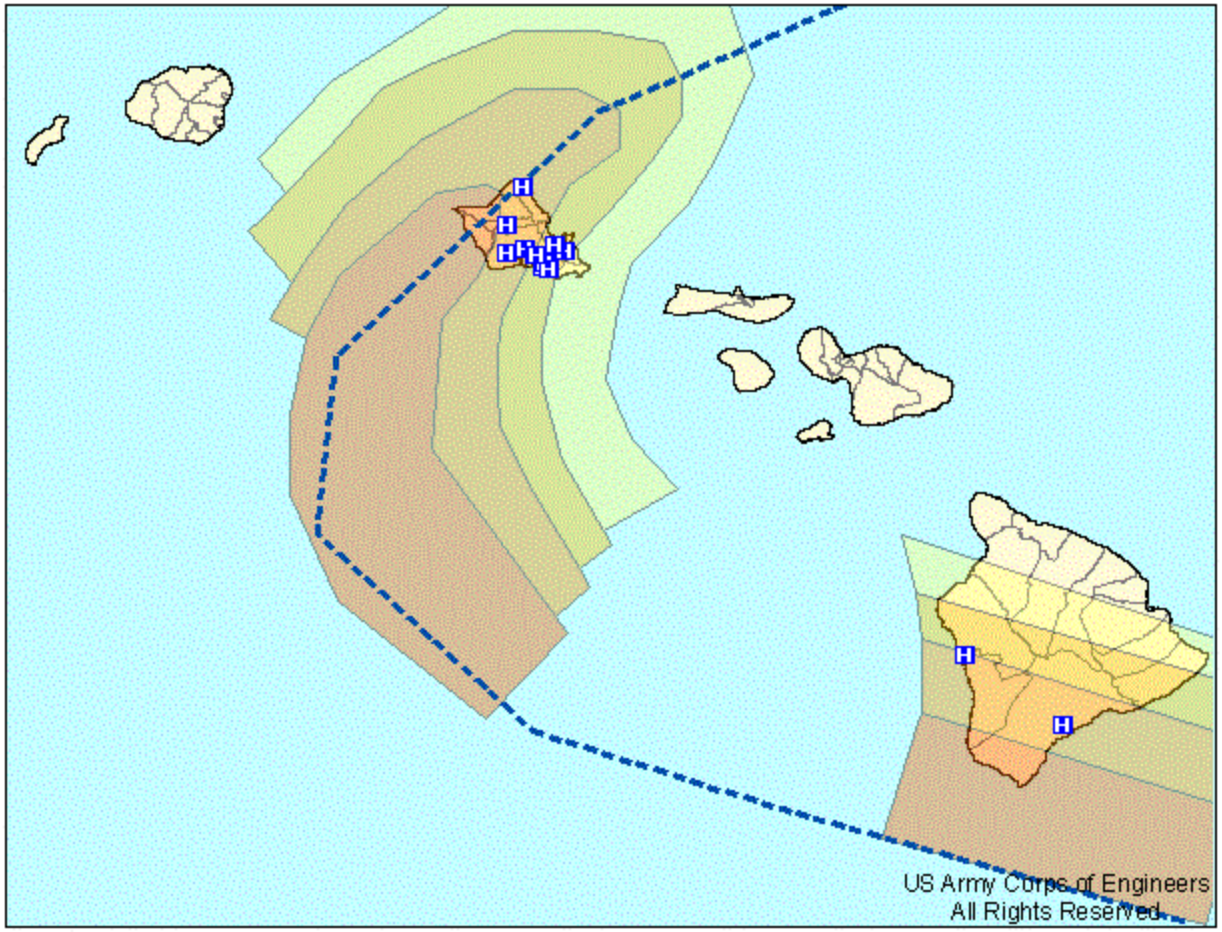
Hurricane Makani Fire Stations	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 15 of 21

US Army Corps of Engineers

Hurricane Makani Hospitals

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

H Hospitals

Forecast Track

Most Probable Landfall Hospitals Inside Hurricane Force Winds

Hawaii - 19

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of hospitals included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

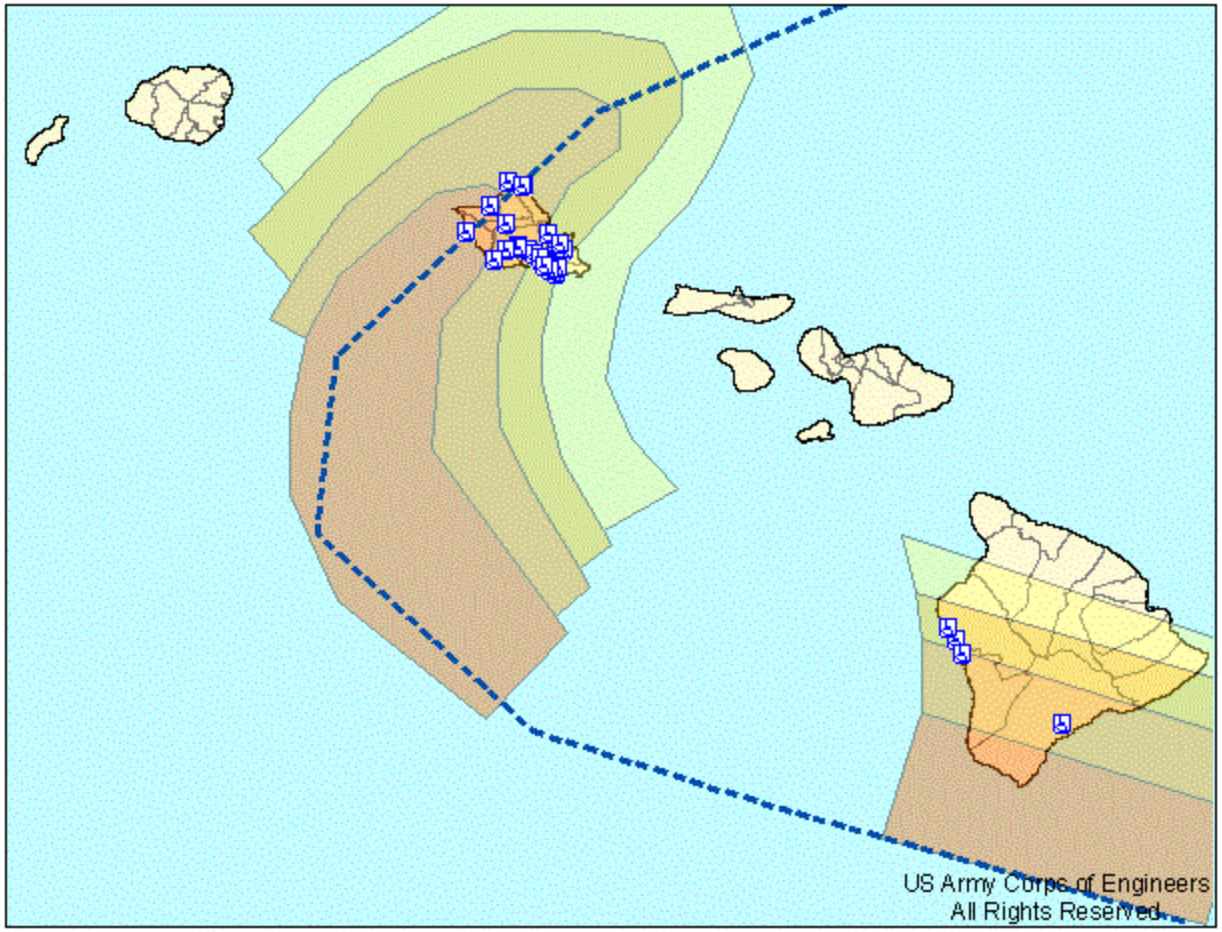
Hurricane Makani Hospitals	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 16 of 21

US Army Corps of Engineers

Hurricane Makani Nursing Homes

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Nursing Homes

Forecast Track

Most Probable Landfall Nursing Homes Inside Hurricane Force Winds

Hawaii - 48

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of nursing homes included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

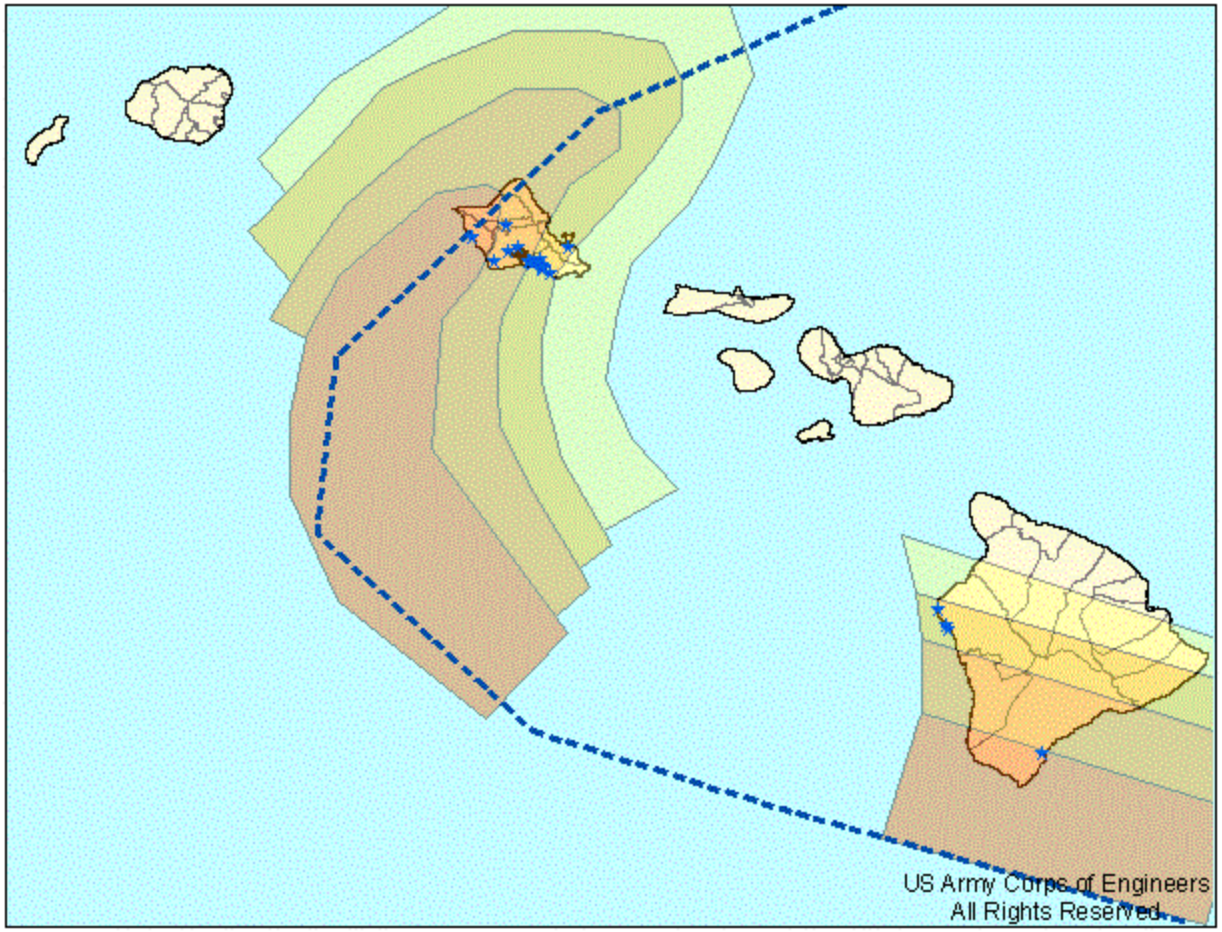
Hurricane Makani Nursing Homes	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 17 of 21

US Army Corps of Engineers

Hurricane Makani Law Enforcement

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

★ Law Enforcement

Forecast Track

Most Probable Landfall Law Enforcement Inside Hurricane Force Winds

Hawaii - 28

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of law enforcement included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

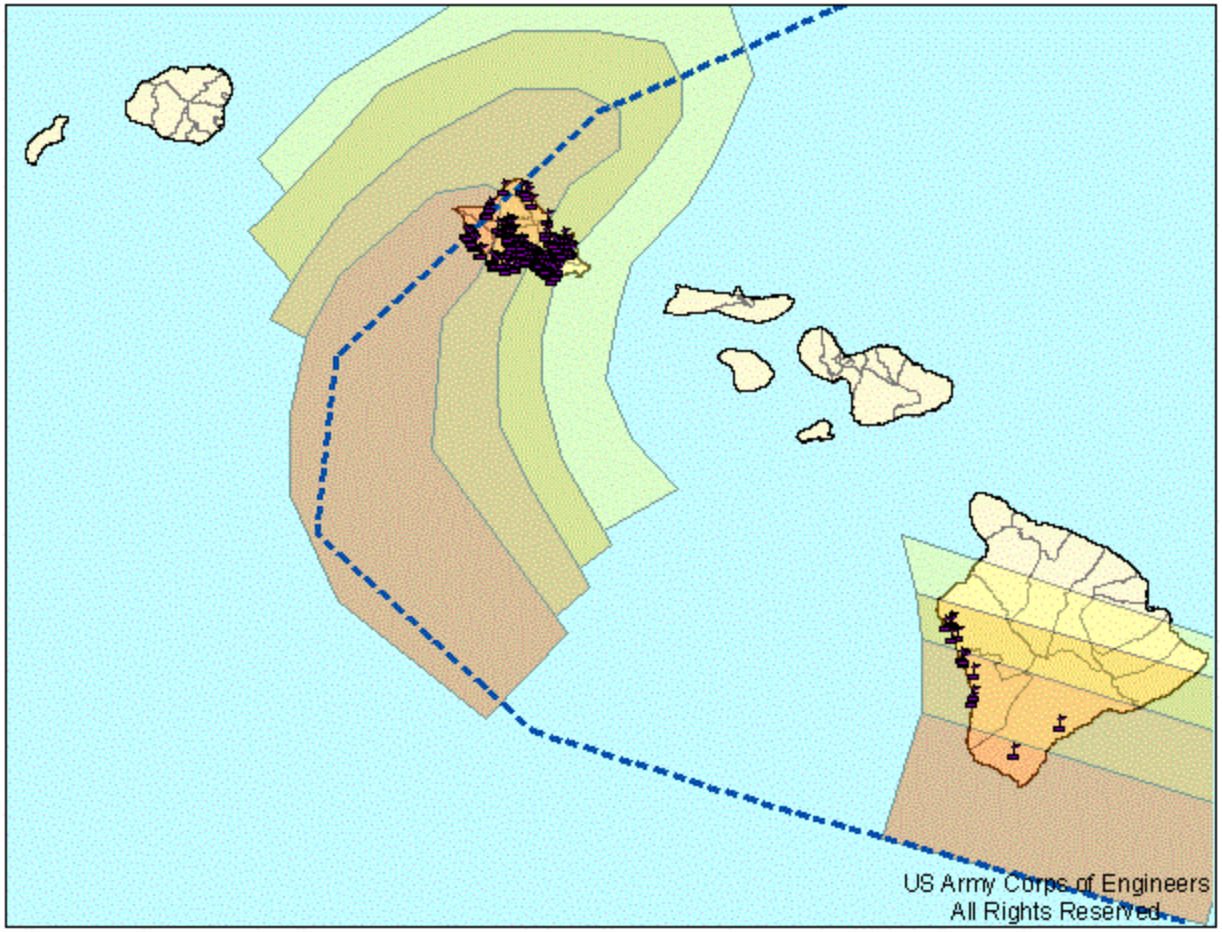
Hurricane Makani Law Enforcement	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 18 of 21

US Army Corps of Engineers

Hurricane Makani Schools

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Most Probable Landfall Schools Inside Hurricane Force Winds

Hawaii - 259

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Schools

Forecast Track

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of schools included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

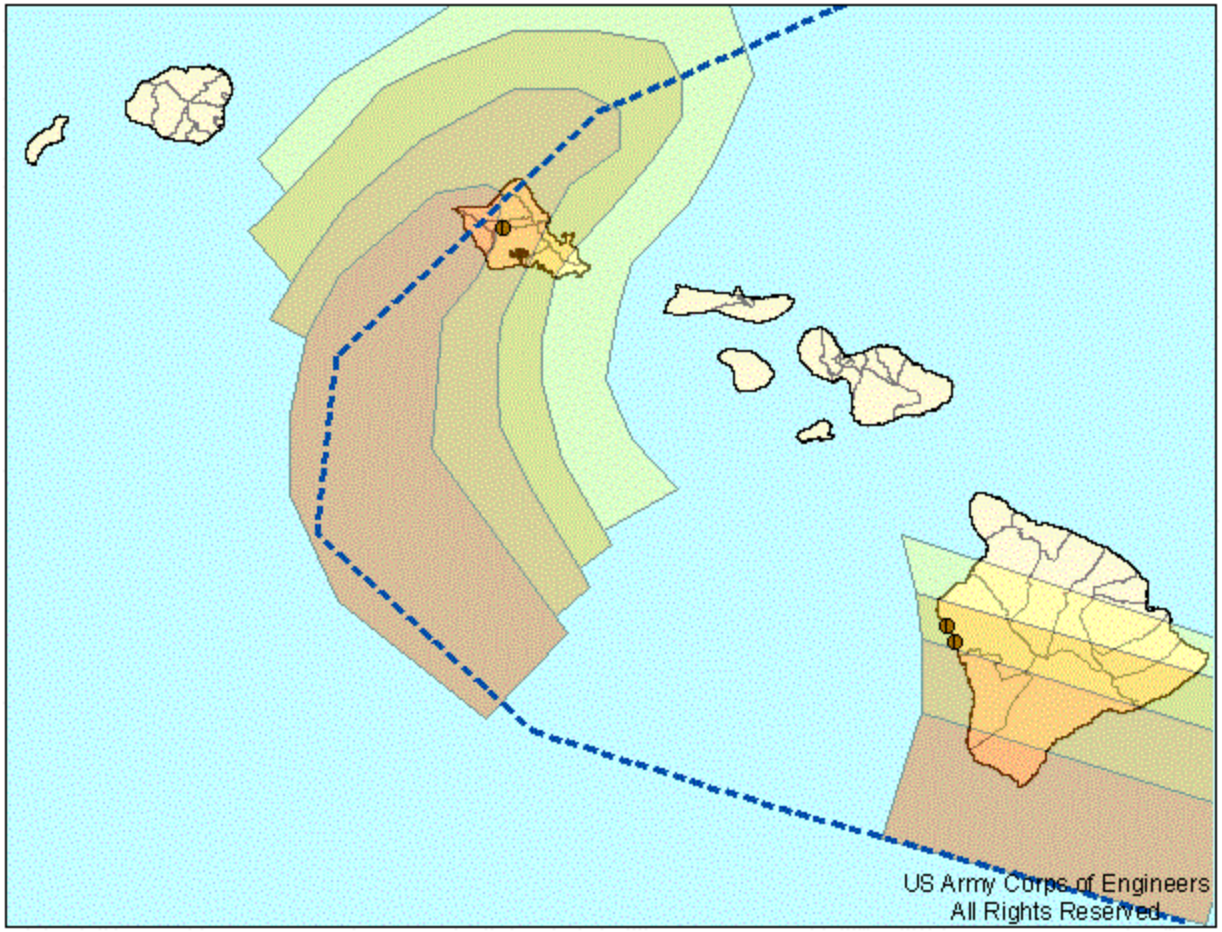
Hurricane Makani Schools	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 19 of 21

Hurricane Makani Sewage Treatment Plants

US Army Corps of Engineers

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Most Probable Landfall Sewage Treatment Plants Inside Hurricane Force Winds

Hawaii - 3

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Sewage Treatment Plants

Forecast Track

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of sewage treatment plants included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Sewage Treatment Plants	
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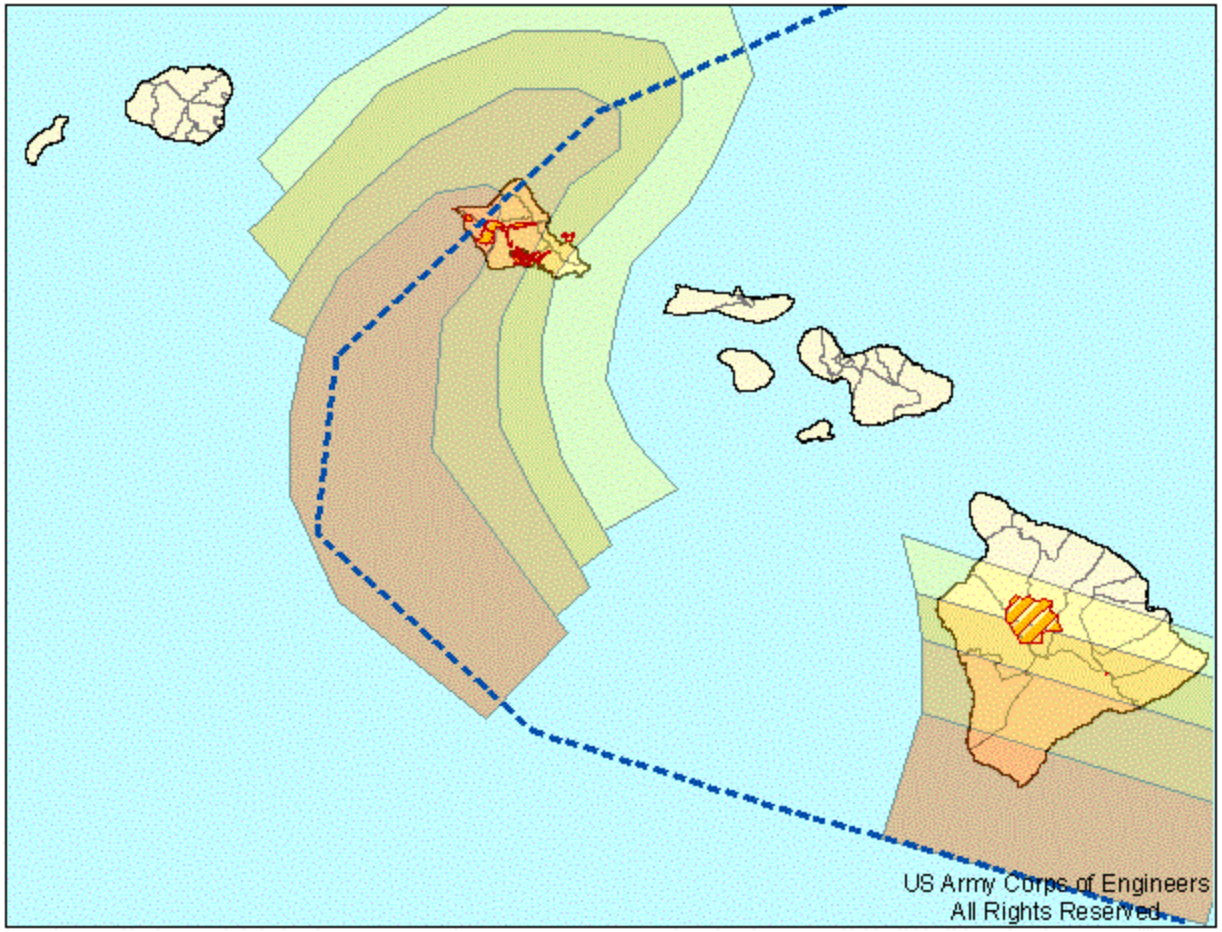
Sources: HURREVAC LRL-DEBRIS	Page 20 of 21

US Army Corps of Engineers

Hurricane Makani Military Bases

Landfall Expected In About 6 Hours

For Planning Purposes Only!



0 100 200 Miles

Forecast Track

Military Bases

Most Probable Landfall Military Bases Inside Hurricane Force Winds

Hawaii - 27

Model results per Geographic Unit on following page

This model is based on a Category 3 storm making landfall passing Hawaii and landfall on Oahu.

Information provided on this page displays a Category 3 storm making landfall passing Hawaii and landfall on Oahu. These projections are based on information from the CPHC (1100 HST 05/21/2008) forecast.

The number of military bases included in this output are those that would be included within estimated hurricane force winds (data source: Homeland Security Infrastructure Program).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Makani Military Bases	
Generated By: Siemsen, LRL 1105 HST 05/21/2008	
Sources: HURREVAC LRL-DEBRIS	Page 21 of 21